

TA-F505ES

SERVICE MANUAL

AEP Model



SPECIFICATIONS

Amplifier section

Items	Condition	Data	
		Model for Scandinavian countries, Switzerland, Spain and Portugal	Model for other countries
Continuous RMS power output (both channels driven simultaneously)	4 ohms, 20 Hz – 20 kHz	—	100 W + 100 W (DIN: 120 W + 120 W)
	6 ohms, 20 Hz – 20 kHz	90 W + 90 W (DIN: 100 W + 100 W)	—
	8 ohms, 20 Hz – 20 kHz	80 W + 80 W (DIN: 90 W + 90 W)	—
Power band width	8 ohms, THD 0.05%	10 Hz – 100 kHz at 40 W	
Dynamic headroom	4 ohms	1.9 dB	
	8 ohms	1.1 dB	
Total harmonic distortion	8 ohms at 10 W output	0.008%	
Intermodulation (IM) distortion 60 Hz: 7 kHz = 4:1	4 ohms, at rated output	0.008%	
	6 ohms, at rated output	0.006%	
	8 ohms, at rated output	0.004%	
Damping factor	8 ohms, at 1 kHz	80	
Residual noise	network A, 8 ohms	less than 110 μ V	
Frequency response	PHONO MM (20 Hz – 20 kHz)	RIAA equalization curve ± 0.2 dB	
	TUNER, CD TAPE 1, 2, 3, DIRECT IN	2 Hz – 200 kHz $+0_{-3}$ dB	

Items	Condition		Data
Input sensitivity	PHONO	MC	0.25 mV/100 ohms
		MM	2.5 mV, 50 kilohms
	TUNER, CD, DIRECT IN, TAPE 1,2,3, ADAPTOR, AUX		150 mV, 20 kilohms
S/N (network)	PHONO	MC	76 dB (0.5 mV)
		MM	93 dB (5.0 mV)
	TUNER, CD, DIRECT IN, TAPE 1,2,3, ADAPTOR, AUX		105 dB (150 mV)
Output voltage impedance	REC OUT 1,2,3 ADAPTOR		150 mV, 1 kilohm
	HEADPHONES		25 milliwatts (at 8 ohms) Accepts low and high impedance headphones
Tone controls	BASS, at 100 Hz		± 7 dB
	TREBLE, at 10 kHz		± 7 dB
Subsonic filter	—		6 dB/octave attenuation below 15 Hz
Muting	—		-20 dB

— Continued on next page —

INTEGRATED STEREO AMPLIFIER
SONY®

General

System

Preamplifier section: Low-noise high gain NFB type equalizer amplifier, passive type direct tone control

Power amplifier section: Pure-complementary SEPP MOS-FET power amplifier

Power requirement

Models for European countries: 220 V – 230 V AC, 50/60 Hz

Power consumption

Model for Scandinavian countries, Switzerland, Spain and Portugal

180 W

Model for other European countries

240 W

Dimensions

Approx. 430 x 150 x 375 mm (w/h/d)
(17 x 5 ⁷/₈ x 14 ³/₄ inches)

Mass

Approx. 14 kg (30 lb 14 oz)

Supplied accessories

Screws (4)

The above values are measured at 230 V AC.

Design and specifications are subject to change without notice.

Note

This appliance conforms with EEC Directive 87/308/EEC regarding interference suppression.

Note :

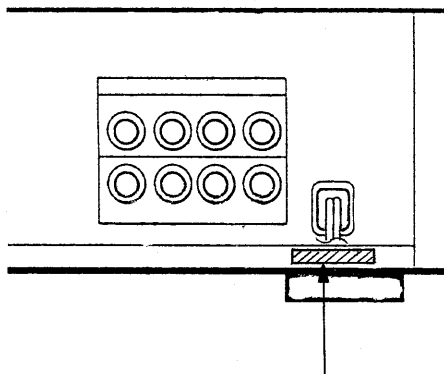
There are two types of power transformer (T901) in German model.
When ordering the power transformer, check the part No. of it.

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MODEL IDENTIFICATION

— BACK PANEL —



4-944-612-1□ AE2 (AEP2) : Scandinavian countries, Switzerland, Spain and Portugal
4-944-612-0□ AE1 (AEP1) : Other European countries
4-944-612-0□ G : Germany

SAFETY-RELATED COMPONENT WARNING!!

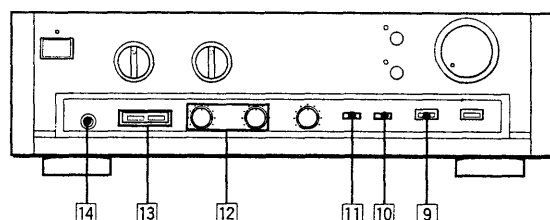
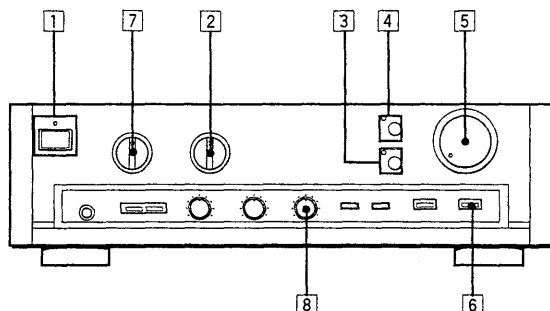
COMPONENTS IDENTIFIED BY MARK  OR DOTTED LINE WITH MARK  ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SECTION 1 GENERAL

This section is extracted from instruction manual.

Identifying the Parts and Controls

Front Panel



1 POWER switch and indicator
After the power is turned on, the standby indicator lights in red as the built-in muting circuit activates. When the amplifier stays in a stable operating condition, the indicator lights in green. The indicator lights in red if the unit detects shorting of circuit of the speaker outputs or in case of short-circuit of the inputs of DC components. In such a case, disconnect the power source and check the connected components and speaker systems.

2 INPUT SELECTOR
Selects the desired program source for listening.

3 SOURCE DIRECT button and indicator
When the button is pressed, the orange indicator lights and the circuits of the TONE control, SUBSONIC filter button, BALANCE control and MODE selector are disengaged regardless of the setting of the switches.

4 MUTING button and indicator
Press the button to reduce the sound level by -20 dB. (Output voltage becomes 1/10.) Generally, set the button to off.

5 ATTENUATOR control
Adjusts the sound level. To increase the sound level, turn the control clockwise. To decrease the level, turn the control counterclockwise.

Note

Turn down the sound level before switching on the unit.
This prevents damage to speakers.

6 CARTRIDGE selector
Set the selector according to your cartridge.
MM: For moving-magnet type cartridge.
MC: For moving-coil type cartridge.

7 REC OUT SELECTOR
Selects the program source sent to the REC OUT jacks for recording.

8 BALANCE control
Adjust BALANCE to correct stereo imaging, when the speaker position is not symmetrical.

9 DIRECT INPUT selector
Set to SOURCE to select program source with the INPUT SELECTOR.
To listen to a program source processed through the equipment, such as graphic equalizer, connected to the ADAPTOR jacks, set it to SOURCE.
To listen to a program source connected to DIRECT IN jacks, set it to DIRECT.

10 SUBSONIC filter button
If subsonic noise components created by warped records, etc. are present, the audible range frequencies may be modulated and cause irritating intermodulation distortion. In this case, press the button to reduce noise components of less than 15 Hz, which cause modulation noise.

11 MODE selector
STEREO: For listening to a stereo program.
MONO: For listening to a monaural program.

12 BASS and TREBLE TONE controls
Adjust the tone quality.
To increase bass or treble sound, turn the control clockwise. To decrease them, turn the control counterclockwise.

13 SPEAKERS buttons
Select speaker system A, B, or A and B.
To drive speaker system A: Press A button.
To drive speaker system B: Press B button.
To drive speaker system A and B: Press both A and B.
For headphones listening only: Press both A and B to OFF (□).

14 HEADPHONES jack
Connect the stereo phone plug of headphones.

SECTION 2 ELECTRICAL ADJUSTMENTS

Bias Adjustment

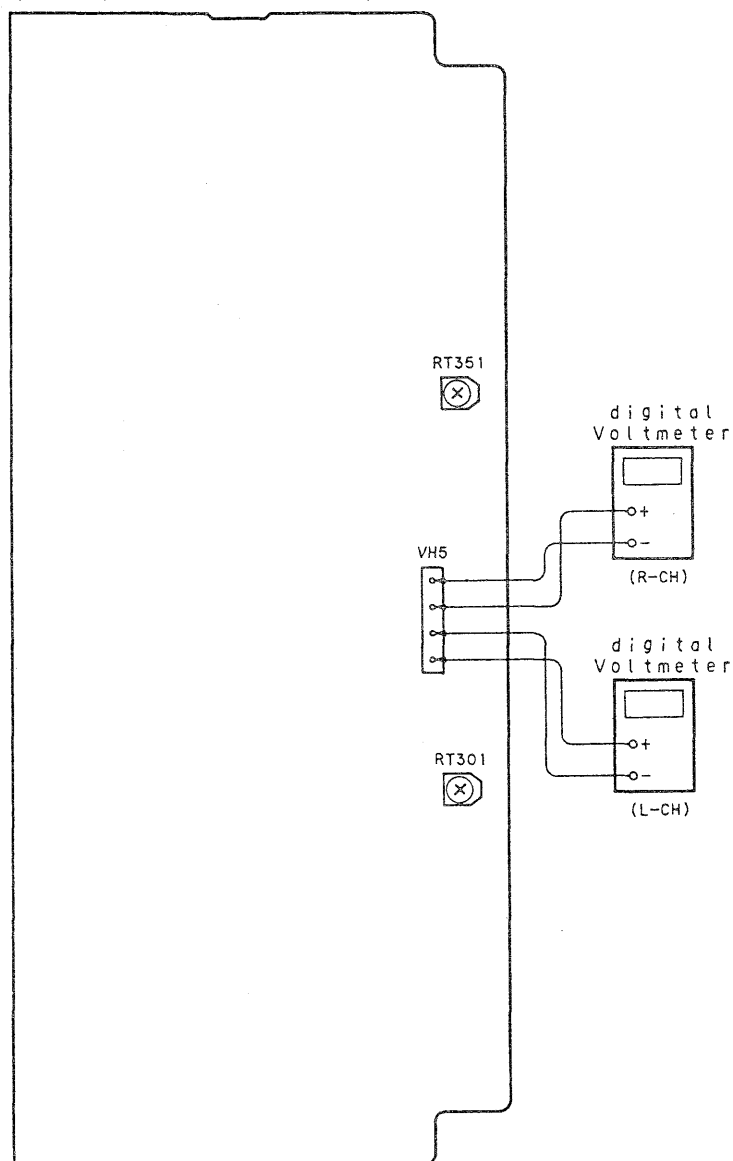
Note: Adjust the idling after tuning the unit on for about 10 minutes, giving it time to warm up.

Procedure :

1. Connect the digital voltmeter to VH5 on main board as follows.
2. Adjust RT301 (L-CL) and RT351 (R-CH) so that the digital voltmeter on signal reads 30mV at VH5.

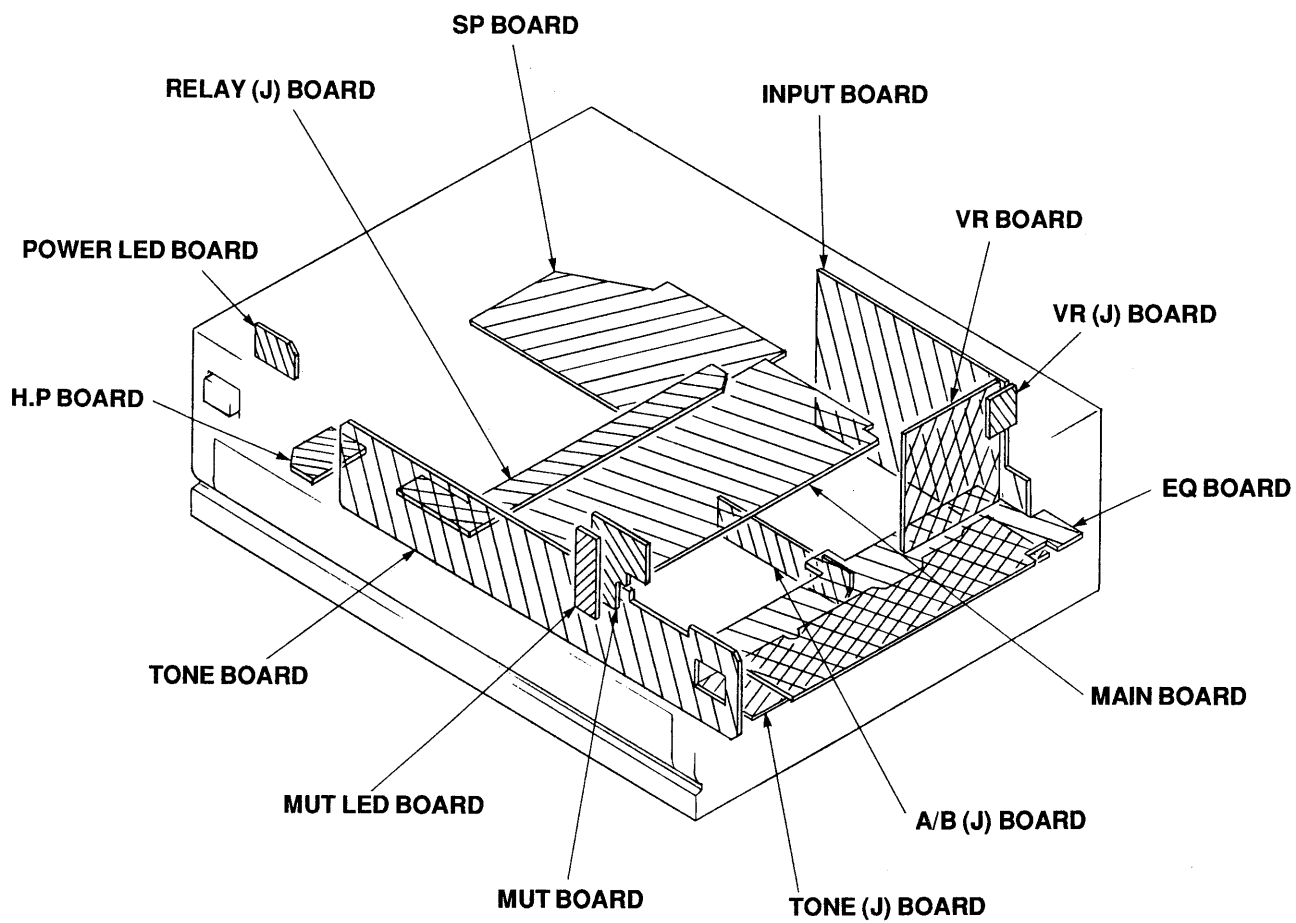
Adjustment Location :

【MAIN BOARD】
(component side)

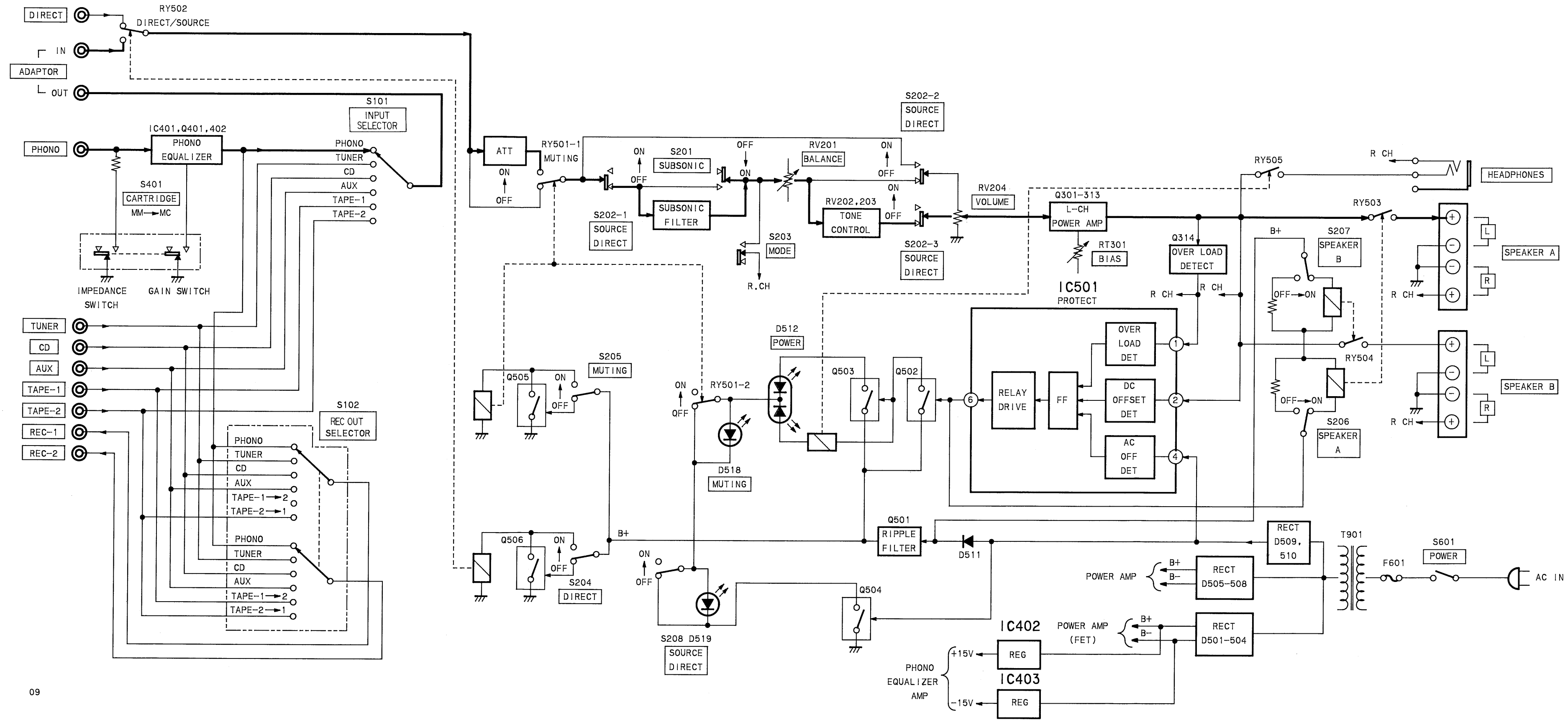


SECTION 3 DIAGRAMS

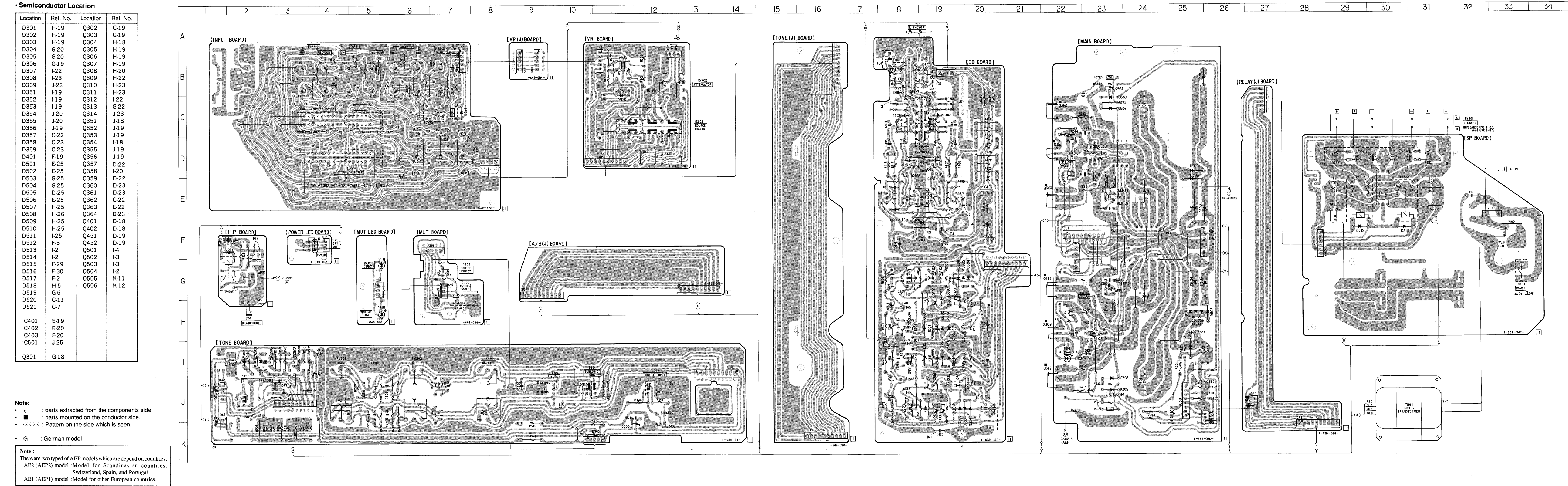
3-1. CIRCUIT BOARDS LOCATION



3-2. BLOCK DIAGRAM



3-3. PRINTED WIRING BOARD
• See page 5 for Circuit Boards Location and see page 16 for Semiconductor Lead Layouts.



Note:

- : parts extracted from the components side.
- : parts mounted on the conductor side.
- : Pattern on the side which is seen.

• G : German model

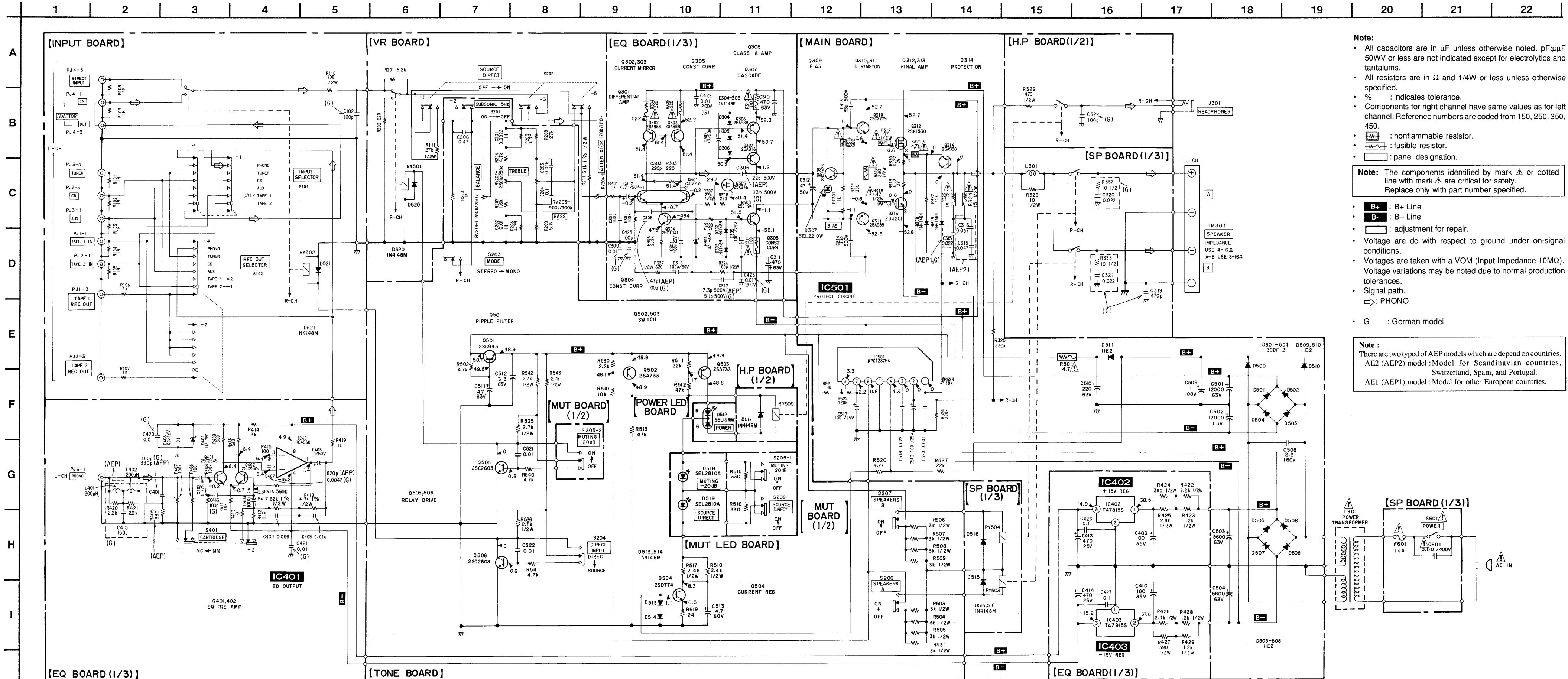
Note :

There are two typed of AEP models which are depend on countries.

AE2 (AEP2) model : Model for Scandinavian countries, Switzerland, Spain, and Portugal.

AE1 (AEP1) model : Model for other European countries.

3-4. SCHEMATIC DIAGRAM
• See page 16 for IC Block Diagram.



Note:

- All capacitors are in μF unless otherwise noted. pF : μF 50VW or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- % : indicates tolerance.
- Components for right channel have same values as for left channel. Reference numbers are coded from 150, 250, 350, 450.
- \square : nonflammable resistor.
- \square : fusible resistor.
- \square : panel designation.

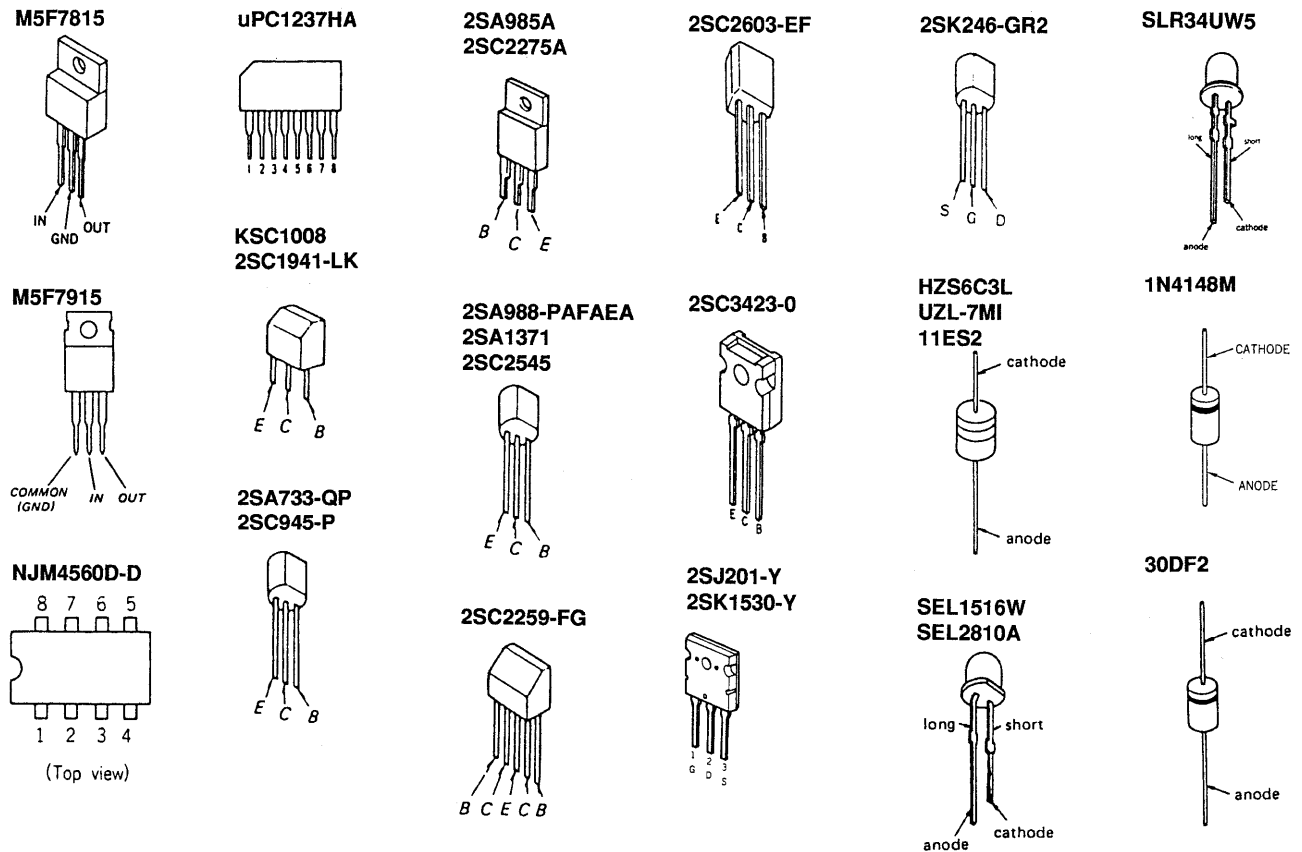
Note: The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

- $B+$: B+ Line
- $B-$: B- Line
- \square : adjustment for repair.
- Voltage are dc with respect to ground under on-signal conditions.
- Voltages are taken with a VOM (Input Impedance 10M Ω). Voltage variations may be noted due to normal production tolerances.
- Signal path.
- \square : PHONO

G : German model

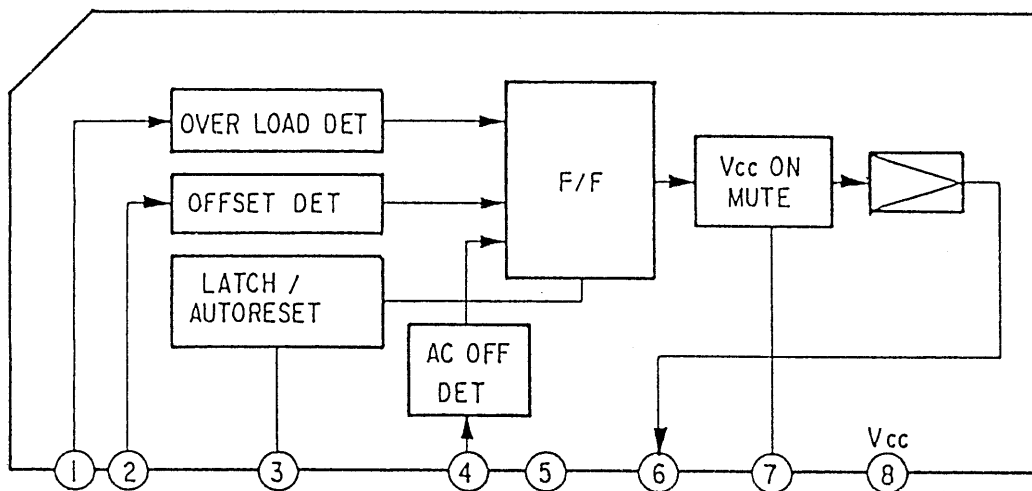
Note : There are two typed of AEP models which are depend on countries.
AE2 (AEP2) model : Model for Scandinavian countries, Switzerland, Spain, and Portugal.
AE1 (AEP1) model : Model for other European countries.

3-5. SEMICONDUCTOR LEAD LAYOUTS



3-6. IC BLOCK DIAGRAM

• IC501 uPC1237HA



SECTION 4

EXPLODED VIEWS

NOTE:

- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.
- G: German model

The components identified by mark or dotted line with mark are critical for safety. Replace only with part number specified.

4-1. FRONT PANEL SECTION

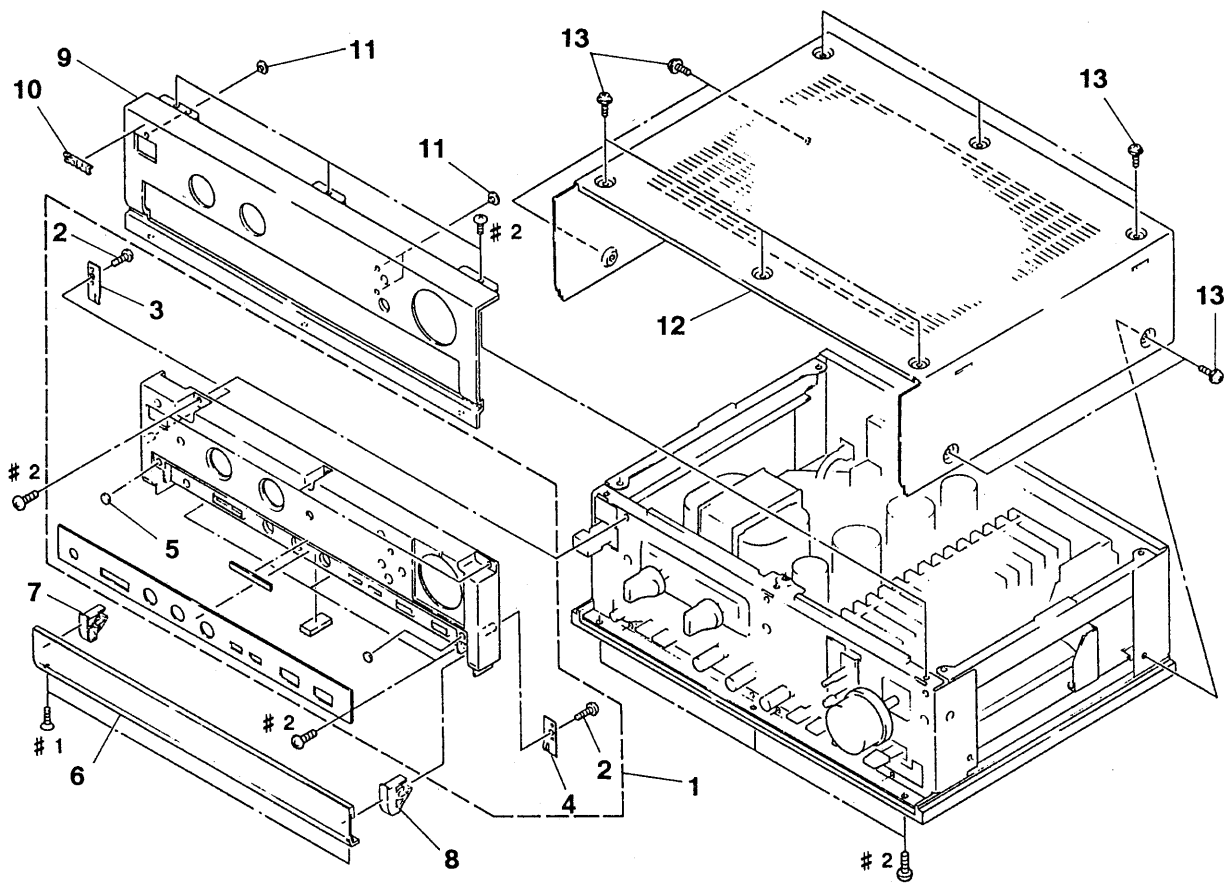
Note:

There are two type of AEP models which are depend on countries.

AE2 (AEP2) model: Model for Scandinavian countries.

Switzerland, Spain and Portugal

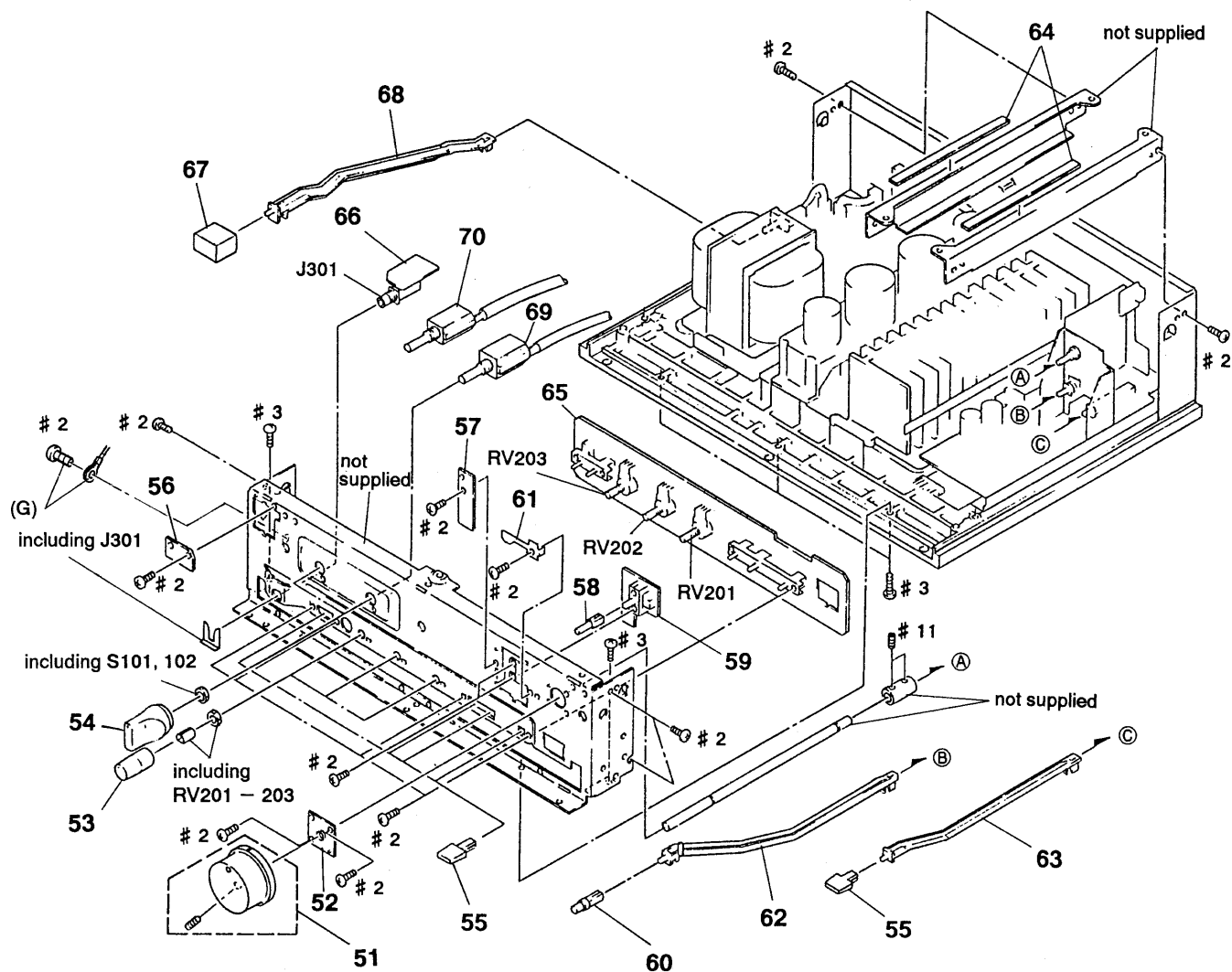
AE1 (AEP1) model: Model for other European countries



Ref. No.	Part No.	Description
1	X-4941-787-1	PANEL (BASE) ASSY
2	4-951-620-01	SCREW (2.6X8), +BVTP
* 3	4-942-233-01	SPRING (L), PLATE
* 4	4-942-234-01	SPRING (R), PLATE
5	4-879-274-01	SPACER
6	4-955-303-21	LID
7	4-942-225-01	ARM (L)

Ref. No.	Part No.	Description
8	4-942-226-01	ARM (R)
9	4-958-199-01	PANEL, FRONT
10	4-942-568-01	EMBLEM (NO. 5), SONY
11	4-931-646-01	LENS, LED
* 12	4-946-347-01	CASE (AEP1, G)
* 12	4-946-347-11	CASE (AEP2)
13	3-704-366-01	SCREW (CASE) (M3X8)

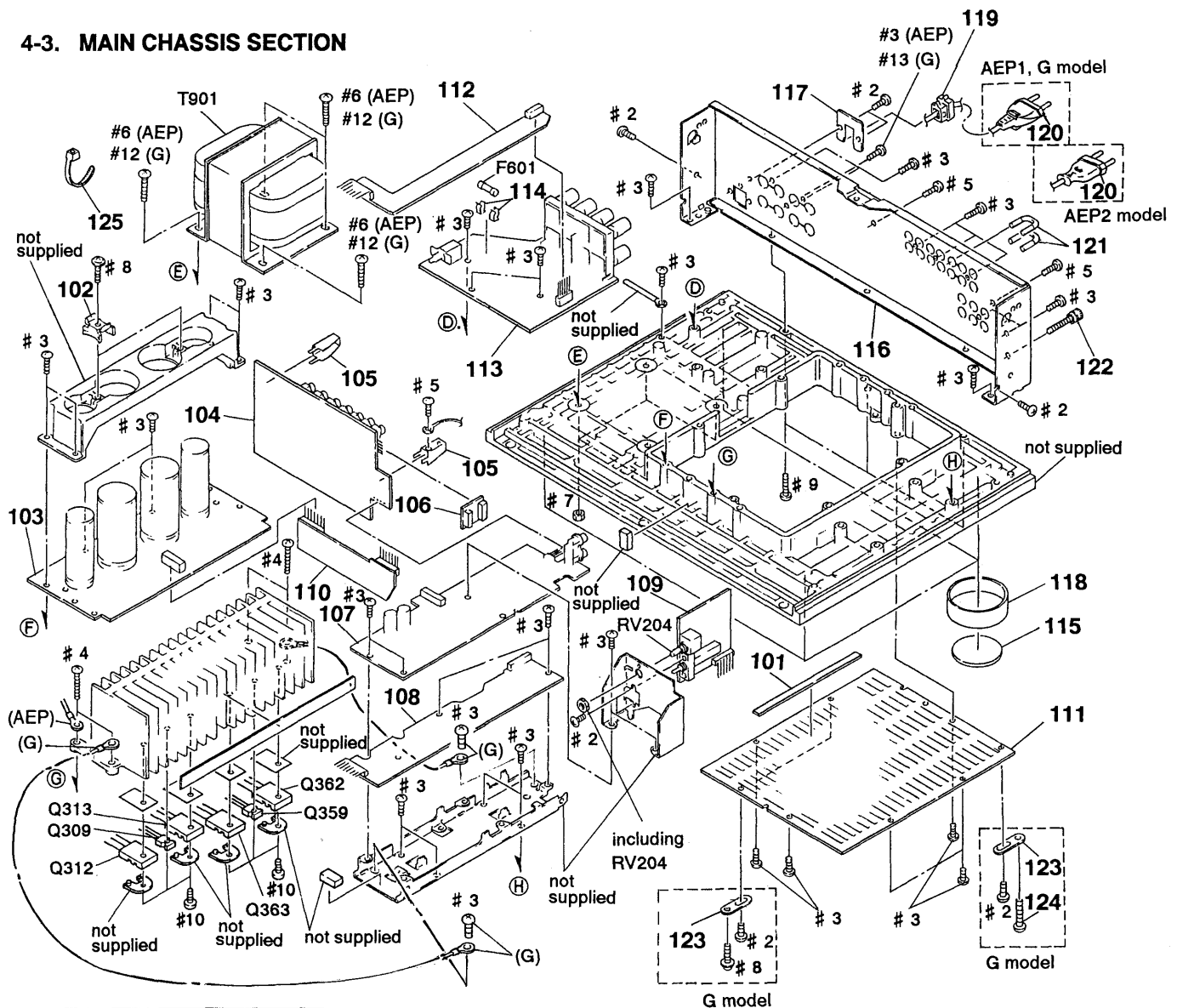
4-2. SUB CHASSIS SECTION





Ref.No.	Part No.	Description
51	4-958-200-01	KNOB (VOL)
52	4-946-335-01	BRACKET (BEARING)
53	4-946-333-01	KNOB (TONE)
54	4-949-932-01	KNOB (DIA. 25)
55	4-942-228-01	KNOB (3X13)
* 56	1-649-093-11	POWER LED BOARD
* 57	1-649-092-11	MUT LED BOARD
58	4-931-641-01	BUTTON (DIA. 4)
* 59	1-649-091-11	MUT BOARD
60	4-931-926-01	BUTTON (B)
61	4-946-732-01	SPRING (S), LEAF

Remark	Ref.No.	Part No.	Description	Remark
	62	4-946-339-01	ROD (S)	
	63	4-946-338-01	ROD (C)	
	* 64	4-916-782-21	DAMPER	
	* 65	A-4360-852-A	TONE BOARD, COMPLETE (AEP1, G)	
	* 65	A-4360-866-A	TONE BOARD, COMPLETE (AEP2)	
	* 66	1-649-089-11	HP BOARD	
	67	4-942-032-01	KNOB (POWER)	
	68	4-946-340-01	ROD (P)	
	69	1-572-742-11	SWITCH, ROTARY (INPUT SELECTOR)	
	70	1-572-743-11	SWITCH, ROTARY (REC OUT SELECTOR)	






4-3. MAIN CHASSIS SECTION



The components identified by mark  or dotted line with mark  are critical for safety. Replace only with part number specified.

Note :

There are two types of power transformer (T901) in German model. When ordering the power transformer, check the part No. of it.

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
* 101	4-916-782-21	DAMPER		* 117	4-923-873-01	BRACKET, CORD STOPPER	
* 102	4-946-329-01	RETAINER, ELECT CAP		118	4-923-882-02	RING (LARGE-16), ORNAMENTAL, FOOT	
* 103	A-4360-851-A	MAIN BOARD, COMPLETE (AEP1)		* 119	3-703-244-00	BUSHING (2104), CORD	
* 103	A-4360-865-A	MAIN BOARD, COMPLETE (AEP2)		 120	1-574-805-11	CORD, POWER (AEP2)	
* 103	A-4360-868-A	MAIN BOARD, COMPLETE (G)		 120	1-696-169-11	CORD, POWER (AEP1, G)	
* 104	1-639-372-11	INPUT BOARD		121	1-573-905-11	PLUG, JUMPER	
* 105	4-946-336-01	BRACKET (GROUND)		122	4-947-010-01	SCREW, FEEDER FIXED	
* 106	1-649-094-11	VR (J) BOARD		* 123	4-941-988-01	BRACKET (GROUND) (G)	
* 107	A-4360-860-A	EQ BOARD, COMPLETE (AEP)		124	4-921-437-01	SCREW (M3X20), TAPPING (G)	
* 107	A-4360-870-A	EQ BOARD, COMPLETE (G)		125	3-655-653-21	BAND (TAITON), BINDING	
* 108	1-649-090-11	TONE (J) BOARD		 F601	1-532-350-00	FUSE, TIME-LAG 4A	
* 109	1-649-088-11	VR BOARD		Q309	8-729-203-45	TRANSISTOR 2SC3423-0	
* 110	1-639-369-11	A/B (J) BOARD		Q312	8-729-015-30	TRANSISTOR 2SK1530-Y	
* 111	4-916-732-01	BOARD, BOTTOM		Q313	8-729-015-31	TRANSISTOR 2SJ201-Y	
* 112	1-639-368-11	RELAY (J) BOARD		Q359	8-729-203-45	TRANSISTOR 2SC3423-0	
* 113	1-639-367-11	SP BOARD		Q362	8-729-015-30	TRANSISTOR 2SK1530-Y	
114	1-533-233-11	HOLDER, FUSE		Q363	8-729-015-31	TRANSISTOR 2SJ201-Y	
* 115	4-923-850-01	FOOT (DIA. 46)		 T901	1-423-682-11	TRANSFORMER, POWER	
* 116	4-944-612-01	PANEL, BACK (AEP1, G)		 T901	1-423-682-21	TRANSFORMER, POWER	
* 116	4-944-612-11	PANEL, BACK (AEP2)					

SECTION 5

ELECTRICAL PARTS LIST

A/B (J)

EQ

NOTE:

The components identified by mark Δ or dotted line with mark Δ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

Note:

There are two type of AEP models which are depend on countries.

AE2 (AEP2) model: Model for Scandinavian countries.
Switzerland, Spain and Portugal

AE1 (AEP1) model: Model for other European countries

• RESISTORS

All resistors are in ohms
METAL: Metal-film resistor
METAL OXIDE: Metal Oxide-film resistor
F : nonflammable

• CAPACITORS

μF : μF

• COILS

μH : μH

• SEMICONDUCTORS

In each case, μ , for example:
 $\mu A...$: $\mu A...$, $\mu PA...$: $\mu PA...$, $\mu PB...$: $\mu PB...$,
 $\mu PC...$: $\mu PC...$, $\mu PD...$: $\mu PD...$

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Hardware (# mark) list is given in the last of this parts list.
- G: German model

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
*	1-639-369-11	A/B (J) BOARD *****		C401	1-110-335-11	MYLAR 100PF 5%	50V (G)
		< CONNECTOR >		C401	1-110-341-11	MYLAR 330PF 5%	50V (AEP)
* CP7	1-568-202-11	PIN, CONNECTOR (PC BOARD) 10P		C402	1-123-369-00	ELECT 4.7 μF 20%	50V
* CP8	1-568-202-11	PIN, CONNECTOR (PC BOARD) 10P		C403	1-124-998-81	ELECT 1000 μF 20%	10V
		*****		C404	1-136-162-00	FILM 0.056 μF 5%	50V
				C405	1-137-471-11	FILM 0.016 μF 5%	50V
*	A-4360-860-A	EQ BOARD, COMPLETE (AEP) *****		C406	1-124-122-11	ELECT 100 μF 20%	50V
				C407	1-130-470-00	MYLAR 820PF 5%	50V (AEP)
				C407	1-130-479-00	MYLAR 0.0047 μF 5%	50V (G)
*	A-4360-870-A	EQ BOARD, COMPLETE (G) *****		C408	1-126-059-11	ELECT 10 μF 20%	50V
				C409	1-124-122-11	ELECT 100 μF 20%	50V
		< CAPACITOR >		C410	1-124-122-11	ELECT 100 μF 20%	50V
C301	1-110-335-11	MYLAR 100PF 5%	50V	C413	1-124-913-11	ELECT 470 μF 20%	50V
C302	1-123-369-00	ELECT 4.7 μF 20%	50V	C414	1-124-913-11	ELECT 470 μF 20%	50V
C303	1-110-339-11	MYLAR 220PF 5%	50V	C415	1-162-284-31	CERAMIC 150PF 10%	50V (G)
C304	1-124-122-11	ELECT 100 μF 20%	50V	C416	1-162-282-31	CERAMIC 100PF 10%	50V (G)
C305	1-124-122-11	ELECT 100 μF 20%	50V	C420	1-161-379-00	CERAMIC 0.01 μF 20%	25V (G)
C306	1-107-159-00	MICA 33PF 5%	500V (G)	C421	1-161-379-00	CERAMIC 0.01 μF 20%	25V (G)
C306	1-107-210-00	MICA 22PF 5%	500V (AEP)	C422	1-106-367-00	MYLAR 0.01 μF 5%	200V (G)
C307	1-124-910-11	ELECT 47 μF 20%	50V	C423	1-106-367-00	MYLAR 0.01 μF 5%	200V (G)
C308	1-101-880-00	CERAMIC 47PF 5%	50V (AEP)	C425	1-162-282-31	CERAMIC 100PF 10%	50V (G)
C308	1-110-335-11	MYLAR 100PF 5%	50V (G)	C426	1-136-165-00	FILM 0.1 μF 5%	50V
C309	1-130-483-00	MYLAR 0.01 μF 5%	50V (G)	C427	1-136-165-00	FILM 0.1 μF 5%	50V
C310	1-126-066-11	ELECT 470 μF 20%	63V	C451	1-110-335-11	MYLAR 100PF 5%	50V (G)
C311	1-126-066-11	ELECT 470 μF 20%	63V	C451	1-110-341-11	MYLAR 330PF 5%	50V (AEP)
C317	1-107-026-00	MICA 5.1PF 500V (G)		C452	1-123-369-00	ELECT 4.7 μF 20%	50V
C317	1-107-044-00	MICA 3.3PF 500V (AEP)		C453	1-124-998-81	ELECT 1000 μF 20%	10V
C318	1-126-052-11	ELECT 100 μF 20%	50V	C454	1-136-162-00	FILM 0.056 μF 5%	50V
C351	1-110-335-11	MYLAR 100PF 5%	50V	C455	1-137-471-11	FILM 0.016 μF 5%	50V
C352	1-123-369-00	ELECT 4.7 μF 20%	50V	C457	1-130-470-00	MYLAR 820PF 5%	50V (AEP)
C353	1-110-339-11	MYLAR 220PF 5%	50V	C457	1-130-479-00	MYLAR 0.0047 μF 5%	50V (G)
C354	1-124-122-11	ELECT 100 μF 20%	50V	C458	1-126-059-11	ELECT 10 μF 20%	50V
C355	1-124-122-11	ELECT 100 μF 20%	50V	C465	1-162-284-31	CERAMIC 150PF 10%	50V (G)
C356	1-107-159-00	MICA 33PF 5%	500V (G)	C466	1-162-282-31	CERAMIC 100PF 10%	50V (G)
C356	1-107-210-00	MICA 22PF 5%	500V (AEP)			< CONNECTOR >	
C357	1-124-910-11	ELECT 47 μF 20%	50V	CP6	1-560-941-00	PIN, CONNECTOR 4P	
C358	1-101-880-00	CERAMIC 47PF 5%	50V (AEP)			< SOCKET >	
C358	1-110-335-11	MYLAR 100PF 5%	50V (G)	* CS9	1-562-334-00	SOCKET, CONNECTOR 10P	
C367	1-107-026-00	MICA 5.1PF 500V (G)					
C367	1-107-044-00	MICA 3.3PF 500V (AEP)					
C368	1-126-052-11	ELECT 100 μF 20%	50V				

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
< DIODE >				< RESISTOR >			
D301	8-719-933-41	DIODE	HZS6C3L	Q401	8-729-354-52	TRANSISTOR	2SC2545
D302	8-719-987-63	DIODE	1N4148M	Q402	8-729-354-52	TRANSISTOR	2SC2545
D303	8-719-987-63	DIODE	1N4148M	Q451	8-729-354-52	TRANSISTOR	2SC2545
D304	8-719-987-63	DIODE	1N4148M	Q452	8-729-354-52	TRANSISTOR	2SC2545
D305	8-719-987-63	DIODE	1N4148M	< RESISTOR >			
D306	8-719-987-63	DIODE	1N4148M	R301	1-247-713-11	CARBON	1K 5% 1/4W F
D351	8-719-933-41	DIODE	HZS6C3L	R302	1-249-469-11	CARBON	100K 5% 1/4W
D352	8-719-987-63	DIODE	1N4148M	R303	1-247-704-11	CARBON	220 5% 1/4W
D353	8-719-987-63	DIODE	1N4148M	△R304	1-212-889-00	FUSIBLE	220 5% 1/4W F
D354	8-719-987-63	DIODE	1N4148M	△R305	1-212-889-00	FUSIBLE	220 5% 1/4W F
D355	8-719-987-63	DIODE	1N4148M	R306	1-247-717-11	CARBON	2.2K 5% 1/4W F
D356	8-719-987-63	DIODE	1N4148M	R307	1-249-490-11	CARBON	27K 5% 1/2W
D401	8-719-000-84	DIODE	UZL-7M1	R308	1-247-704-11	CARBON	220 5% 1/4W
< PLUG >				R309	1-247-721-11	CARBON	4.7K 5% 1/4W
* EH2	1-564-506-11	PLUG, CONNECTOR 3P		△R310	1-212-881-11	FUSIBLE	100 5% 1/4W F
< IC >				△R311	1-212-881-11	FUSIBLE	100 5% 1/4W F
IC401	8-759-745-61	IC	NJM4560D-D	R326	1-249-721-11	CARBON	100K 5% 1/2W
IC402	8-759-231-59	IC	M5F7815	R327	1-249-668-11	CARBON	620 5% 1/2W
IC403	8-759-245-87	IC	M5F7915	R351	1-247-713-11	CARBON	1K 5% 1/4W F
< COIL >				R352	1-249-469-11	CARBON	100K 5% 1/4W
L401	1-424-397-11	COIL, CHOKE	200uH (G)	R353	1-247-704-11	CARBON	220 5% 1/4W
L402	1-424-397-11	COIL, CHOKE	200uH (G)	△R354	1-212-889-00	FUSIBLE	220 5% 1/4W F
L451	1-424-397-11	COIL, CHOKE	200uH (G)	△R355	1-212-889-00	FUSIBLE	220 5% 1/4W F
L452	1-424-397-11	COIL, CHOKE	200uH (G)	R356	1-247-717-11	CARBON	2.2K 5% 1/4W F
< JACK >				R357	1-249-490-11	CARBON	27K 5% 1/2W
PJ6	1-580-054-11	JACK, PIN 2P		R358	1-247-704-11	CARBON	220 5% 1/4W
< TRANSISTOR >				R359	1-247-721-11	CARBON	4.7K 5% 1/4W
Q301	8-729-620-17	TRANSISTOR	2SC2259-FG	△R360	1-212-881-11	FUSIBLE	100 5% 1/4W F
Q302	8-729-140-82	TRANSISTOR	2SA988-PAFAEA	△R361	1-212-881-11	FUSIBLE	100 5% 1/4W F
Q303	8-729-140-82	TRANSISTOR	2SA988-PAFAEA	R376	1-249-721-11	CARBON	100K 5% 1/2W
Q304	8-729-142-01	TRANSISTOR	2SC1941-LK	R377	1-249-668-11	CARBON	620 5% 1/2W
Q305	8-729-201-56	TRANSISTOR	2SK246-GR2	R405	1-247-706-11	CARBON	330 5% 1/4W F (AEP)
Q306	8-729-140-82	TRANSISTOR	2SA988-PAFAEA	R406	1-247-700-11	CARBON	100 5% 1/4W
Q307	8-729-803-76	TRANSISTOR	2SA1371	R407	1-249-469-11	CARBON	100K 5% 1/4W
Q308	8-729-142-01	TRANSISTOR	2SC1941-LK	R408	1-249-469-11	CARBON	100K 5% 1/4W
Q351	8-729-620-17	TRANSISTOR	2SC2259-FG	R409	1-247-710-11	CARBON	560 5% 1/4W
Q352	8-729-140-82	TRANSISTOR	2SA988-PAFAEA	R410	1-247-710-11	CARBON	560 5% 1/4W
Q353	8-729-140-82	TRANSISTOR	2SA988-PAFAEA	R411	1-247-725-11	CARBON	10K 5% 1/4W
Q354	8-729-142-01	TRANSISTOR	2SC1941-LK	R412	1-249-529-11	CARBON	110 5% 1/4W
Q355	8-729-201-56	TRANSISTOR	2SK246-GR2	R413	1-249-504-11	CARBON	10 5% 1/4W
Q356	8-729-140-82	TRANSISTOR	2SA988-PAFAEA	R414	1-247-138-00	CARBON	2K 5% 1/4W
Q357	8-729-803-76	TRANSISTOR	2SA1371	R415	1-247-700-11	CARBON	100 5% 1/4W
Q358	8-729-142-01	TRANSISTOR	2SC1941-LK	R416	1-214-958-00	METAL	560K 1% 1/4W
				R417	1-249-845-91	CARBON	62K 1% 1/2W
				R418	1-249-818-11	CARBON	4.7K 1% 1/2W
				R419	1-247-713-11	CARBON	1K 5% 1/4W F
				R420	1-249-421-11	CARBON	2.2K 5% 1/4W F (G)
				R421	1-249-421-11	CARBON	2.2K 5% 1/4W F (G)
				R422	1-247-753-11	CARBON	1.2K 5% 1/2W
				R423	1-247-753-11	CARBON	1.2K 5% 1/2W

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Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
		< RELAY >					
RY502	1-515-727-11	RELAY		D501	8-719-230-02	DIODE 30DF2	
		< SWITCH >		D502	8-719-230-02	DIODE 30DF2	
S101	1-571-115-11	SWITCH, SLIDE (INPUT SELECTOR)		D503	8-719-230-02	DIODE 30DF2	
S102	1-571-115-11	SWITCH, SLIDE (REC OUT SELECTOR)		D504	8-719-230-02	DIODE 30DF2	
*****				D505	8-719-200-82	DIODE 11ES2	
*	A-4360-851-A	MAIN BOARD, COMPLETE (AEP1)		D506	8-719-200-82	DIODE 11ES2	
		*****		D507	8-719-200-82	DIODE 11ES2	
*	A-4360-865-A	MAIN BOARD, COMPLETE (AEP2)		D508	8-719-200-82	DIODE 11ES2	
		*****		D509	8-719-200-82	DIODE 11ES2	
*	A-4360-868-A	MAIN BOARD, COMPLETE (G)		D510	8-719-200-82	DIODE 11ES2	
		*****		D511	8-719-200-82	DIODE 11ES2	
		< CAPACITOR >				< IC >	
C312	1-126-051-11	ELECT 47uF 20% 50V		IC501	8-759-111-68	IC uPC1237HA	
C313	1-102-233-00	CERAMIC 33PF 10% 500V				< TRANSISTOR >	
C314	1-102-233-00	CERAMIC 33PF 10% 500V		Q309	8-729-203-45	TRANSISTOR 2SC3423-0	
C315	1-130-487-00	MYLAR 0.022uF 5% 50V		Q310	8-729-107-53	TRANSISTOR 2SC2275A	
		(AEP1, G)		Q311	8-729-141-10	TRANSISTOR 2SA985A	
C315	1-130-491-00	MYLAR 0.047uF 5% 50V (AEP2)		Q312	8-729-015-30	TRANSISTOR 2SK1530-Y	
C316	1-130-491-00	MYLAR 0.047uF 5% 50V (AEP2)		Q313	8-729-015-31	TRANSISTOR 2SJ201-Y	
C362	1-126-051-11	ELECT 47uF 20% 50V		Q314	8-729-140-82	TRANSISTOR 2SA988-PAFAEA	
C363	1-102-233-00	CERAMIC 33PF 10% 500V		Q359	8-729-203-45	TRANSISTOR 2SC3423-0	
C364	1-102-233-00	CERAMIC 33PF 10% 500V		Q360	8-729-107-53	TRANSISTOR 2SC2275A	
C365	1-130-487-00	MYLAR 0.022uF 5% 50V		Q361	8-729-141-10	TRANSISTOR 2SA985A	
		(AEP1, G)		Q362	8-729-015-30	TRANSISTOR 2SK1530-Y	
C365	1-130-491-00	MYLAR 0.047uF 5% 50V (AEP2)		Q363	8-729-015-31	TRANSISTOR 2SJ201-Y	
C366	1-130-491-00	MYLAR 0.047uF 5% 50V (AEP2)		Q364	8-729-140-82	TRANSISTOR 2SA988-PAFAEA	
C501	1-104-839-11	ELECT 12000uF 20% 63V				< RESISTOR >	
C502	1-104-839-11	ELECT 12000uF 20% 63V		△R314	1-247-711-11	CARBON 680 5% 1/4W F	
C503	1-104-838-11	ELECT 5600uF 20% 63V		R315	1-247-706-11	CARBON 330 5% 1/4W F	
C504	1-104-838-11	ELECT 5600uF 20% 63V		△R316	1-212-994-00	FUSIBLE 330 5% 1/2W F	
C508	1-136-880-11	FILM 2.2uF 10% 160V		△R317	1-212-974-00	FUSIBLE 47 5% 1/2W F	
C509	1-126-069-11	ELECT 1uF 20% 100V		△R318	1-212-974-00	FUSIBLE 47 5% 1/2W F	
C510	1-126-064-11	ELECT 220uF 20% 63V		R319	1-217-151-00	RES, METAL PLATE 0.22 2W	
C517	1-126-023-11	ELECT 100uF 20% 25V		R320	1-217-151-00	RES, METAL PLATE 0.22 2W	
C518	1-130-487-00	MYLAR 0.022uF 5% 50V		△R321	1-247-721-11	CARBON 4.7K 5% 1/4W F	
C519	1-126-023-11	ELECT 100uF 20% 25V		R322	1-249-460-11	CARBON 15K 5% 1/4W F	
C520	1-130-471-00	MYLAR 0.001uF 5% 50V		△R323	1-212-962-00	FUSIBLE 15 5% 1/2W F	
		< DIODE >		△R324	1-212-962-00	FUSIBLE 15 5% 1/2W F	
D307	8-719-900-19	LED SLR34UW5		R325	1-247-891-00	CARBON 330K 5% 1/4W	
D308	8-719-987-63	DIODE 1N4148M		△R364	1-247-711-11	CARBON 680 5% 1/4W F	
D309	8-719-987-63	DIODE 1N4148M		R365	1-247-706-11	CARBON 330 5% 1/4W F	
D357	8-719-900-19	LED SLR34UW5		△R366	1-212-994-00	FUSIBLE 330 5% 1/2W F	
D358	8-719-987-63	DIODE 1N4148M		△R367	1-212-974-00	FUSIBLE 47 5% 1/2W F	
D359	8-719-987-63	DIODE 1N4148M		△R368	1-212-974-00	FUSIBLE 47 5% 1/2W F	
				R369	1-217-151-00	RES, METAL PLATE 0.22 2W	
				R370	1-217-151-00	RES, METAL PLATE 0.22 2W	
				△R371	1-247-721-11	CARBON 4.7K 5% 1/4W F	

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MAIN	MUT	MUT LED	POWER LED	RELAY (J)	SP
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Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
R372	1-249-460-11	CARBON	15K 5% 1/4W			< CONNECTOR >	
△R373	1-212-962-00	FUSIBLE	15 5% 1/2W F	* DR5	1-564-337-00	PIN, CONNECTOR 3P	
△R374	1-212-962-00	FUSIBLE	15 5% 1/2W F			*****	
R375	1-247-891-00	CARBON	330K 5% 1/4W				
△R501	1-212-849-00	FUSIBLE	4.7 5% 1/4W F	*	1-639-368-11	RELAY (J) BOARD	

R520	1-247-721-11	CARBON	4.7K 5% 1/4W			< CONNECTOR >	
R521	1-249-461-11	CARBON	18K 5% 1/4W	* CP9	1-568-202-11	PIN, CONNECTOR (PC BOARD) 10P	
R522	1-247-881-00	CARBON	120K 5% 1/4W	* DR6	1-564-338-00	PIN, CONNECTOR 4P	
R523	1-247-725-11	CARBON	10K 5% 1/4W			< SOCKET >	
R524	1-247-887-00	CARBON	220K 5% 1/4W				
R527	1-249-462-11	CARBON	22K 5% 1/4W				
		< VARIABLE RESISTOR >					
RT301	1-237-456-11	RES, ADJ, CARBON 1K		CS10	1-561-115-00	SOCKET, CONNECTOR 6P	
RT351	1-237-456-11	RES, ADJ, CARBON 1K				*****	
		*****		*	1-639-367-11	SP BOARD	
*	1-649-091-11	MUT BOARD				*****	

		< CONNECTOR >			1-533-233-11	HOLDER, FUSE	
						< BUS BAR >	
CP5	1-568-577-11	PIN, CONNECTOR (PC BOARD) 3P		* BB1	1-560-242-61	BUS BAR 2P	
		< RESISTOR >		* BB2	1-560-242-61	BUS BAR 2P	
						< CAPACITOR >	
R515	1-247-706-11	CARBON	330 5% 1/4W F	C319	1-130-467-00	MYLAR	470PF 5% 50V (G)
R516	1-247-706-11	CARBON	330 5% 1/4W F	C320	1-130-487-00	MYLAR	0.022uF 5% 50V (G)
		< SWITCH >		C321	1-130-487-00	MYLAR	0.022uF 5% 50V (G)
S205	1-572-740-11	SWITCH, PUSH (1 KEY) (MUTING -20dB)		C369	1-130-467-00	MYLAR	470PF 5% 50V (G)
S208	1-572-143-11	SWITCH, SLIDE (SOURCE DIRECT)		C370	1-130-487-00	MYLAR	0.022uF 5% 50V (G)
		*****		C371	1-130-487-00	MYLAR	0.022uF 5% 50V (G)
*	1-649-092-11	MUT LED BOARD		△C601	1-161-741-00	CERAMIC	0.001uF 10% 400V
		*****				< CONNECTOR >	
		< SOCKET >		* CP10	1-580-854-11	PIN, CONNECTOR (PC BOARD) 6P	
				SE1	1-564-320-00	PIN, CONNECTOR 2P	
* CS7	1-565-835-11	SOCKET, CONNECTOR 3P		SE2	1-564-320-00	PIN, CONNECTOR 2P	
		< DIODE >		* VH9	1-564-321-00	PIN, CONNECTOR 2P	
				* VH10	1-564-321-21	PIN, CONNECTOR 2P	
D518	8-719-301-49	LED	SEL2810A			< DIODE >	
D519	8-719-301-49	LED	SEL2810A				
		*****		D515	8-719-987-63	DIODE	1N4148M
*	1-649-093-11	POWER LED BOARD		D516	8-719-987-63	DIODE	1N4148M
		*****				< FUSE >	
		< DIODE >		△F601	1-532-350-00	FUSE, TIME-LAG T4A	
D512	8-719-313-40	LED	SEL1516W				

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Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
< COIL >				< SOCKET >			
* L301	1-422-009-13	COIL, AIR-CORE		* CS2	1-562-334-00	SOCKET, CONNECTOR 10P	
* L351	1-422-009-13	COIL, AIR-CORE		* CS4	1-562-334-00	SOCKET, CONNECTOR 10P	
< RESISTOR >				< DIODE >			
R328	1-247-727-11	CARBON	10 5% 1/2W	D513	8-719-987-63	DIODE 1N4148M	
R332	1-247-727-11	CARBON	10 5% 1/2W (G)	D514	8-719-987-63	DIODE 1N4148M	
R333	1-247-727-11	CARBON	10 5% 1/2W (G)	< TRANSISTOR >			
R378	1-247-727-11	CARBON	10 5% 1/2W	Q501	8-729-194-57	TRANSISTOR 2SC945-P	
R382	1-247-727-11	CARBON	10 5% 1/2W (G)	Q502	8-729-141-03	TRANSISTOR 2SA733-QP	
R383	1-247-727-11	CARBON	10 5% 1/2W (G)	Q503	8-729-141-03	TRANSISTOR 2SA733-QP	
< RELAY >				Q504	8-729-140-96	TRANSISTOR KSC1008	
RY503	1-515-501-00	RELAY		Q505	8-729-620-05	TRANSISTOR 2SC2603-EF	
RY504	1-515-501-00	RELAY		Q506	8-729-620-05	TRANSISTOR 2SC2603-EF	
< SWITCH >				< RESISTOR >			
△S601	1-554-920-11	SWITCH, PUSH (AC POWER) (1 KEY) (POWER)		R203	1-246-545-00	CARBON 1.0M 5% 1/4W	
< TERMINAL >				R204	1-247-721-11	CARBON 4.7K 5% 1/4W	
TM301	1-537-227-11	TERMINAL BOARD (SP) (SPEAKER) (AEP2)		R205	1-259-502-11	CARBON 4.7M 5% 1/4W	
TM301	1-537-228-11	TERMINAL BOARD (SP) (SPEAKER) (G)		R206	1-259-502-11	CARBON 4.7M 5% 1/4W	
TM301	1-537-235-11	TERMINAL BOARD (SP) (SPEAKER) (AEP1)		R207	1-249-928-11	CARBON 1.6K 5% 1/4W	
*****				R208	1-249-586-11	CARBON 27K 5% 1/4W	
* A-4360-852-A	TONE BOARD, COMPLETE (AEP1, G)			R209	1-247-148-00	CARBON 5.1K 5% 1/4W	
*****				R253	1-246-545-00	CARBON 1.0M 5% 1/4W	
* A-4360-866-A	TONE BOARD, COMPLETE (AEP2)			R254	1-247-721-11	CARBON 4.7K 5% 1/4W	
*****				R255	1-259-502-11	CARBON 4.7M 5% 1/4W	
< CAPACITOR >				R256	1-259-502-11	CARBON 4.7M 5% 1/4W	
C201	1-106-351-00	MYLAR 2200PF 5% 200V		R257	1-249-928-11	CARBON 1.6K 5% 1/4W	
C202	1-130-483-00	MYLAR 0.01uF 5% 50V		R258	1-249-586-11	CARBON 27K 5% 1/4W	
C203	1-130-486-00	MYLAR 0.018uF 10% 50V		R259	1-247-148-00	CARBON 5.1K 5% 1/4W	
C204	1-136-165-00	FILM 0.1uF 5% 50V		R502	1-247-721-11	CARBON 4.7K 5% 1/4W	
C206	1-136-173-00	FILM 0.47uF 5% 50V		R503	1-247-251-00	CARBON 3K 5% 1/2W	
C251	1-106-351-00	MYLAR 2200PF 5% 200V		R504	1-247-251-00	CARBON 3K 5% 1/2W	
C252	1-130-483-00	MYLAR 0.01uF 5% 50V		R505	1-247-251-00	CARBON 3K 5% 1/2W	
C253	1-130-486-00	MYLAR 0.018uF 10% 50V		R506	1-247-251-00	CARBON 3K 5% 1/2W	
C254	1-136-165-00	FILM 0.1uF 5% 50V		R507	1-247-251-00	CARBON 3K 5% 1/2W	
C256	1-136-173-00	FILM 0.47uF 5% 50V		R508	1-247-251-00	CARBON 3K 5% 1/2W	
C511	1-126-062-11	ELECT 47uF 20% 63V		R509	1-247-251-00	CARBON 3K 5% 1/2W	
C512	1-126-219-11	ELECT 3.3uF 20% 63V		R510	1-247-725-11	CARBON 10K 5% 1/4W	
C513	1-126-163-11	ELECT 4.7uF 20% 50V		R511	1-249-462-11	CARBON 22K 5% 1/4W	
C521	1-130-483-00	MYLAR 0.01uF 5% 50V		R512	1-249-465-11	CARBON 47K 5% 1/4W	
C522	1-130-483-00	MYLAR 0.01uF 5% 50V		R513	1-249-465-11	CARBON 47K 5% 1/4W	
< CONNECTOR >				R517	1-247-249-00	CARBON 2.4K 5% 1/2W	
* CP11	1-560-531-00	PIN, CONNECTOR 5P		R518	1-247-249-00	CARBON 2.4K 5% 1/2W	
				R519	1-247-092-00	CARBON 24 5% 1/4W	
				R525	1-247-757-11	CARBON 2.7K 5% 1/2W	

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TONE TONE (J) VR VR (J)

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
R526	1-247-757-11	CARBON	2.7K 5% 1/2W	R211	1-214-881-00	METAL	5.1K 1% 1/2W
R530	1-247-717-11	CARBON	2.2K 5% 1/4W F	R251	1-249-942-11	CARBON	6.2K 5% 1/4W
R531	1-247-251-00	CARBON	3K 5% 1/2W	R252	1-247-712-11	CARBON	820 5% 1/4W
R540	1-247-721-11	CARBON	4.7K 5% 1/4W	R261	1-214-881-00	METAL	5.1K 1% 1/2W
R541	1-247-721-11	CARBON	4.7K 5% 1/4W			< VARIABLE RESISTOR >	
R542	1-247-757-11	CARBON	2.7K 5% 1/2W	RV204	1-223-400-11	RES, VAR, CARBON 120K/120K (ATTENUATOR)	
R543	1-247-757-11	CARBON	2.7K 5% 1/2W			< RELAY >	
		< VARIABLE RESISTOR >		RY501	1-515-727-11	RELAY	
RV201	1-241-517-11	RES, VAR, CARBON 250K/250K (BALANCE)				< SWITCH >	
RV202	1-223-401-11	RES, VAR, CARBON 250K/250K (TREBLE)		S202	1-572-741-11	SWITCH, PUSH (1 KEY) (SOURCE DIRECT)	
RV203	1-223-402-11	RES, VAR, CARBON 900K/900K (BASS)				*****	
		< SWITCH >		*	1-649-094-11	VR (J) BOARD	*****
S201	1-572-738-11	SWITCH, PUSH (3 KEY) (SUB SONIC 15Hz)				*****	
S203	1-572-738-11	SWITCH, PUSH (3 KEY) (MODE)				MISCELLANEOUS	*****
S204	1-572-738-11	SWITCH, PUSH (3 KEY) (DIRECT INPUT)		69	1-572-742-11	SWITCH, ROTARY (INPUT SELECTOR)	
S206	1-572-739-11	SWITCH, PUSH (2 KEY) (SPEAKERS A)		70	1-572-743-11	SWITCH, ROTARY (REC OUT SELECTOR)	
S207	1-572-739-11	SWITCH, PUSH (2 KEY) (SPEAKERS B)		△120	1-574-805-11	CORD, POWER (AEP2)	
		*****		△120	1-696-169-11	CORD, POWER (AEP1, G)	
*	1-649-090-11	TONE (J) BOARD	*****	121	1-573-905-11	PLUG, JUMPER	
		< CONNECTOR >		△F601	1-532-350-00	FUSE, TIME-LAG 4A	
* CP4	1-568-202-11	PIN, CONNECTOR (PC BOARD) 10P		Q309	8-729-203-45	TRANSISTOR 2SC3423-0	
		< SOCKET >		Q312	8-729-015-30	TRANSISTOR 2SK1530-Y	
* CS6	1-563-106-11	CONNECTOR (SOCKET) 10P		Q313	8-729-015-31	TRANSISTOR 2SJ201-Y	
		*****		Q359	8-729-203-45	TRANSISTOR 2SC3423-0	
*	1-649-088-11	VR BOARD	*****	Q362	8-729-015-30	TRANSISTOR 2SK1530-Y	
		< CONNECTOR >		Q363	8-729-015-31	TRANSISTOR 2SJ201-Y	
* CP1	1-568-202-11	PIN, CONNECTOR (PC BOARD) 10P		△T901	1-423-682-11	TRANSFORMER, POWER	
* CP2	1-560-531-00	PIN, CONNECTOR 5P		△T901	1-423-682-21	TRANSFORMER, POWER	
		< DIODE >				*****	
D520	8-719-987-63	DIODE 1N4148M				ACCESSORIES & PACKING MATERIALS	*****
		< PLUG >				3-755-923-11	MANUAL, INSTRUCTION
* EH1	1-564-506-11	PLUG, CONNECTOR 3P					(English, French, Spanish, Portuguese) (AEP)
		< RESISTOR >				3-755-923-41	MANUAL, INSTRUCTION
R111	1-249-490-11	CARBON	27K 5% 1/2W				(German, Dutch, Swedish, Italian)
R161	1-249-490-11	CARBON	27K 5% 1/2W	*	4-929-219-01	CUSHION	
R201	1-249-942-11	CARBON	6.2K 5% 1/4W	*	4-958-317-01	INDIVIDUAL CARTON	
R202	1-247-712-11	CARBON	820 5% 1/4W			*****	

Note :

There are two types of power transformer (T901) in German model.
When ordering the power transformer, check the part No. of it.

The components identified by mark △ or dotted line with mark △ are critical for safety.
Replace only with part number specified.

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remark</u>

HARDWARE LIST			

#1	7-685-234-19	SCREW +KTP 2.6X8 TYPE2NON-SLIT	
#2	7-682-547-09	SCREW +BVTT 3X6 (S)	
#3	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S	
#4	7-685-650-79	SCREW +BVTP 3X16 TYPE2 SLIT	
#5	7-682-548-09	SCREW (3X8)	
#6	7-682-565-09	SCREW +B 4X16	
#7	7-684-024-04	N 4, TYPE 2	
#8	7-685-648-79	SCREW +BVTP 3X12 TYPE2 N-S	
#9	7-685-876-09	SCREW +BVTT 3X16 (S)	
#10	7-685-649-79	SCREW +BVTP 3X14 TYPE2 IT-3	
#11	7-683-255-58	SET SCREW 5X6 HEXAGON SOCKET	
#12	7-682-566-09	SCREW +B 4X20	
#13	7-621-849-00	SCREW, TAPPING (G)	

